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**JOINT FORCE TRACKING--THE IMPACT ON REGENERATING  
COMBAT POWER**

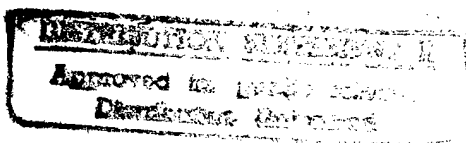
by

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The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.



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Abstract of

JOINT FORCE TRACKING--THE IMPACT ON  
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Joint Force Commanders (JFC) face significant challenges in future conflicts. These challenges stem not only from an unidentifiable enemy but also from changes in U.S. force structure. While regional instability grows throughout each Commander-in-Chief's area of responsibility (AOR), austere U.S. defense budgets and political mandates shrink military force structure, reduce U.S. forward presence, and move the JFC further from his AOR.

These trends magnify the importance of joint force tracking and its impact on regenerating combat power. Lessons learned from Operations Desert Shield and Desert Storm identified the lack of joint force tracking capability as a U.S. military weakness. Emerging Command, Control, Communications, Computers, and Intelligence (C4I) technology provides the framework within which a force tracking system is being developed. The system will enable the JFC to "see" forces, equipment, and logistics that are in-transit or that are already in the theater of operations. The system must be simple, easy-to-use, and integral with the Global Command and Control System (GCCS) now used by the joint community.

A general understanding of system capabilities is important, however, the main purpose of this paper is to synthesize force tracking concepts and analyze the impact of space, time, and force on the JFC's ability to regenerate combat power quickly and effectively.

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## INTRODUCTION

The Joint Force Commander (JFC) faces significant challenges in future conflict. Unfriendly nations continue to enhance military infrastructure and offensive capabilities while sacrificing political stability, protection of natural resources, humane treatment of citizens, and economic improvement. As a result, worldwide instability and unrest increase.

Iran recently acquired its third Kilo Class submarine from Russia and has added numerous fast patrol boats and ballistic missiles to its military inventory. Enhanced mine laying capability poses a threat to Sea Lines of Communication and major oil transportation routes. Islamic fundamentalism coupled with anti-American fervor continues to spark terrorist attacks around the globe.

Iraq continues a covert attempt to rebuild forces and infrastructure bolstered recently by the United Nations' partial suspension of economic sanctions imposed after the Gulf War. With the infusion of cash, Iraq will probably attempt procurement of additional military hardware.

Concurrently, in response to mounting pressure from Congress, the U.S. Department of Defense considers additional reductions in military spending, end strength, infrastructure, and forward-based presence. Meanwhile, redeployment of forward-based forces and delayed investment in force modernization continue.

Should a major crisis erupt in Southwest Asia or any other area that threatens U.S. national security, U.S. forces must overcome several challenges: first, they must deploy from CONUS to the area of conflict with, most likely, intermediate staging stops; second,

they must link with appropriate equipment and logistics, e.g., armor or artillery; and third, they must move to contingent locations as necessary to delay or attack the enemy or defend territory. These challenges raise critical questions: can JFCs exploit C4I technology to enhance their joint force tracking capability within the AOR; and, can this ability regenerate sufficient combat power quickly enough to accomplish operational and strategic objectives?

The purpose of this paper is to *synthesize* force tracking concepts, analyzing the impact of force tracking on the regeneration of combat power from a JFC perspective. My thesis asserts that by synthesizing force tracking concepts and by incorporating an integrated, easy-to-use C4I-based force tracking system, the answers to the above questions are yes.

The unique location of U.S. Central Command Headquarters in relation to its AOR provides a framework within which to explore this thesis.

Unlike most unified commands, USCENTCOM's headquarters and military forces are not permanently located within the assigned AOR. This factor, the size of the AOR, the limited in-place C4 infrastructure within the AOR, inadequate mapping of the area, and location of USCENTCOM headquarters 7,000 air miles from the AOR, are major influences on the C4 capabilities required to complete assigned missions.<sup>1</sup>

Regenerating and sustaining combat power is crucial to any JFC whose forces, equipment, and logistics support are not in the AOR. Considering the distance of USCENTCOM headquarters to the AOR, the operational factors of space, time, and force significantly affect the commander's ability to regenerate combat power. According to General Vuono, former U.S. Army Chief of Staff,

... sustainment of combat power is an essential and critical part of the operational art. The sustainment end is to provide continuous support without

loss of combat power. It is indeed not solely a logistics issue. Logistics, personnel, material, transportation, facilities, and service are the means to achieve the end. Normally, the means will be limited and must be applied carefully to conserve combat power. The judicious application of the means using the sustainment activities of lines of support, staging, altering lines of communication, prioritizing, and force expansion will create the combat power to be applied at the crucial time and place.<sup>2</sup>

During future conflict, the JFC must exploit joint force tracking capability to gain decision-making flexibility. The ability to track force movement enables the JFC to adjust the movement as required, matching forces with equipment and massing them as necessary to meet changing situations. This ability plays a decisive role in regenerating combat power quickly, efficiently, and effectively.

## **SYSTEMS BACKGROUND**

This paper neither focuses on the technological aspects of force tracking nor endorses a specific force tracking "system". However, an understanding of emerging capabilities is necessary. Force tracking capabilities have evolved "... through history from audibles (shouts, drums, horns, booms), to visuals (hand signals, flags, smoke, flashing light), to couriers (runners, riders, carrier pigeons), to electronics-based systems in more modern times (telegraph, 'wireless' radio, message traffic, satellite communications, electronic mail, video)."<sup>3</sup> Operations Desert Shield and Desert Storm identified force tracking as a critical capability required by JFCs to enhance their warfighting skills. Exploitation of C4I technology moves the JFC closer to obtaining real-time information on force location as well as the ability to relay changing force decisions. Each service chief and the Chairman of the Joints Chiefs of Staff (CJCS) have

developed their own operational vision for the 21st century. These visions exploit advancing C4I technologies, e.g., “Sea Dragon” (Marines), “Force XXI” (Army) and “Joint Vision 2010” (CJCS). The concepts of “dominant maneuver” and “focused logistics” included in “Joint Vision 2010” emphasize force tracking capability. “Current systems, enhanced by information superiority, will provide a clearer picture of enemy and friendly locations. Information superiority also will allow joint commanders to coordinate widely dispersed units, receive accurate feedback, and execute more demanding, higher precision requirements.”<sup>4</sup> The U.S. Army plays a key role in developing a joint system that employs force tracking capability. As the Undersecretary of Defense for Logistics’ executive agent, the Army is developing a Total Asset Visibility (TAV) system that includes a force visibility module. According to Army Field Manual 100-5, this joint system

... must accurately track friendly forces and forecast their arrival in the theater so that commanders can react to last minute adjustments. These forecasts provide flexibility and help commanders keep their options open. Space-based systems can greatly facilitate the commander’s real time knowledge of unit status and visibility of other key assets, as well as supplement other intelligence systems. Establishing adequate communications networks may require linking with compatible commercial systems.<sup>5</sup>

Ultimately, whatever force tracking system is developed, it must interact with the GCCS, which now provides primary command and control capability for the JFC. GCCS provides “. . . situational awareness displays, with instant access to readiness data . . . , intelligence . . . , logistics . . . , a wide variety of decision aids, and much more.”<sup>6</sup> Besides integrated functionality, the system must be simple to use. Movement of forces in response to crisis situations does not lend itself to a cumbersome, labor-intensive system.



Functionality, simplicity, and reliability are critical because in the fog of war, the JFC will not have time to read the maintenance and operator's manual.

Material tracking is as equally important as force tracking. A key factor in regenerating combat power is matching equipment with joint forces in theater. Whether the equipment is prestaged on ships, in-transit from distant locations, or already on the ground in theater, TAV enables the JFC to quickly match equipment with forces. This capability minimizes time and maximizes speed in regenerating combat power.

JFCs "... must have visibility of the assets already deployed in theater and of those which are enroute. Common, accurate, timely, and readily accessible information is needed by the JTF Commander, the CINC, and all of the supporting activities."<sup>7</sup>

### **THE INFLUENCE OF OPERATIONAL FACTORS**

From the USCENTCOM perspective, force movement and the regeneration of combat power are two of his primary concerns. Forces must move from their U.S. bases to ports of embarkation. From there, the forces move by sea or air to intermediate ports of debarkation. Forces may continue moving until reaching final ports of debarkation. From the final port, forces must join with necessary equipment then move to their assigned positions. Each of these stops degrades combat power. Only as forces join with their equipment and logistics support can they begin to regenerate combat power. The JFC's effectiveness at regenerating combat power depends on his ability to track these forces, join them with required equipment, then mass them to accomplish operational objectives. Considering the distance from CENTCOM headquarters to the AOR, the

operational factors of space, time, and force significantly impact the JFC's decision-making process and ability to quickly regenerate combat power.

### **Space**

Distance affects not only the movement of forces but also joining forces with the equipment needed to produce firepower. Force tracking assists the JFC in overcoming this disadvantage. The JFC's ability to affect or alter strategy is "... characterized by the ways there are of overcoming the effects of distance, be it on the movement of troops, on the effectiveness of distance weapons, or on the transmission of reports and orders."<sup>8</sup>

Once forces are in theater, the JFC's task is to control the battle space. The battle space

... has expanded dramatically as have events and combat systems that can impact on it. The challenges to control battle space have increased as have the penalties for failing to know what is where within that space and how those resources can be respectively protected, denied, damaged, or destroyed. ... Understanding battle space allows commanders to synchronize combat power against the enemy and keep the enemy commander from extending his own battle space to its greatest range.<sup>9</sup>

Space also offers the JFC flexibility in using joint forces. Tracking forces enroute to the AOR is one of the JFC's major concerns; however, other forces may already be in theater. Force tracking enables the JFC to also "see" these in-theater forces and mass them accordingly. The JFC then has the flexibility to adjust ports of debarkation for the forces enroute to meet changing situations in the theater.

## Time

The impact of time on the JFC's ability to regenerate combat power is similar to space. Again, distance to the AOR significantly increases the time necessary for joint forces to arrive in theater.

With the beginning of a new engagement, a new battle or a new campaign, everything before becomes irrelevant, and everything to come is self-contained and synergistic for a limited, finite time. In this regard, time is the fourth dimension of battle space. Viewed from one perspective, time is a "correcting mechanism" for the commander. Viewed from another perspective, time can be a constraint. It can define the deadline by which a commander must accomplish his aims.<sup>10</sup>

With force tracking capability, the JFC can mass or move forces more effectively, use forces already in the theater more efficiently, and join forces with equipment more rapidly and successfully. During Operations Desert Shield and Desert Storm, had the JFC not "... had the extended period of time to deploy, the tactical situation might have been precarious. DOD needs the ability to bring forces to bear more quickly, effectively, and decisively with minimum risk to human life."<sup>11</sup> With force tracking capability, time becomes an ally of the JFC. Rerouting of joint forces as necessary to appropriate ports of debarkation, saves time in getting them to assigned positions and in regenerating combat power. Additionally, when joint forces are correctly routed to their equipment, time is not wasted searching for equipment inadvertently routed to another location or "lost" in unmarked containers, which happened during the Gulf War. The JFC will not always have the same amount of time available during Operations Desert Shield and Desert Storm to regenerate combat power. However, exploiting force tracking capabilities minimizes time-imposed constraints.

As joint forces arrive in theater, visibility of these forces enables the JFC to mass them according to threat. Massing of forces accelerates if their locations are known. Acceleration translates into quicker mission accomplishment and additional time to plan and prepare for subsequent operations.

JFCs geographically separated from their AOR may face an enemy who has had sufficient time to establish a well-fortified defense. A force tracking system not only provides visibility of joint forces but also enables the JFC to establish an advantageous tempo that can defeat a well-fortified defender.

The effect of information-age technology has been not only to increase the tempo of operations but also to provide images of operations that begin to condition strategic plans and define time limits of operations. . . . The commander considers this and reaches beyond his immediate tasks to see the interrelationships, complexities, and opportunities offered by high-tempo, simultaneous operations. The commander's job has always been to bring order out of chaos; he must now do it quicker, while on the move, and with practical insight.<sup>12</sup>

Increased operational tempos create

. . . conditions for a very rapid conclusion of the defeat of the opposing enemy, facilitate surprise in actions and retention of the initiative in the course of combat, and also substantially hinder the enemy in employing nuclear weapons against attacking troops. The defender under these conditions does not have time to take measures directed toward delay and disruption of the attacker's blows. The higher the rates of attack, the greater are the chances to win victory over the enemy in a short time, and the greater the scope of the operation.<sup>13</sup>

To a JFC stationed outside the AOR, the criticality of time takes on a new meaning when contrasted with the enemy's location. Iraqi troops, for example, are only minutes from Kuwait. However, CENTCOM forces are hours away. Force tracking is extremely important to the JFC in minimizing the impact of this time-distance mismatch.

Visibility of forces in theater enhances the JFC's ability to analyze the developing situation and move these forces into advantageous positions.

The relationship between space and time is critical to the JFC in planning and executing an operation. "Space and time are the framework within which the commander moves about his forces. In view of their effects on his plans and on the probable moves of his opponent, they are the most important factors in shaping his decisions."<sup>14</sup> This importance manifests itself as the commander tracks joint forces to mass them effectively and quickly to regenerate combat power.

### **Force**

Force also has a significant impact on the regeneration of combat power. The regeneration of combat power is dependent on joining equipment with forces. "The factor of 'Force' should not be understood as 'troops,' or 'naval forces,' or 'air forces' but as forces of all services with their required logistical support, controlled by the operational commander."<sup>15</sup> The JFC must use force tracking capabilities to move forces as necessary, generating sufficient combat power to achieve the operational objective. Combat power enables the JFC to focus sufficient force to achieve success through destruction of the enemy. It occurs when force is massed quickly, denying the enemy any effective means to respond.<sup>16</sup> "It is consequently *of the utmost importance to estimate properly the offensive and defensive power of the hostile and of our own troops, and to apportion the forces accordingly* [emphasis in original]."<sup>17</sup>

Force tracking enables the JFC to apportion joint forces more effectively. For example, there may not be sufficient CENTCOM forces in theater to counter a surprise

attack by Iraq on Saudi Arabia or Kuwait. While overwhelming force is desirable in battle, the JFC can still prevail with outnumbered forces by using his force tracking capability as an enhancement to his knowledge of the operational art.

As Clausewitz points out, the correct identification of the decisive point offers the outnumbered force a degree of relative superiority. Armed with the knowledge of the decisive point, the outnumbered force then masses its strength against it. In doing so, it causes the most destruction and dislocation of the enemy's center of gravity. As with the center of gravity, the outnumbered force must also select the correct decisive point on the first try. Therefore, application of force at the correct decisive point enables the outnumbered force to destroy the enemy at a rate that ensures the collapse of his center of gravity.<sup>18</sup>

Just as the space-time relationship is important to the JFC in generating combat power, the force-time relationship is critical when forces are not in the AOR. The force-time relationship challenged General Schwarzkopf in his efforts to deploy over 500,000 troops into theater during Operations Desert Shield and Desert Storm, join them with necessary equipment, then move them to designated positions. "General Schwarzkopf explained his concept of operations in a news briefing shortly after the victorious ground campaign. His concept was predicated on building up the force, first to deter the enemy from attacking (thereby gaining time) and then to defend. Each day won time and gave credibility to deterrence."<sup>19</sup>

The Gulf War highlighted the importance of developing a technologically advanced force tracking system. Future operations may not provide the JFC a mature theater within which to operate as did Operations Desert Shield and Desert Storm. Consequently, a force tracking system which assists the JFC in overcoming space, time, and force constraints is a critical necessity.

## FORCE TRACKING FROM AN HISTORICAL PERSPECTIVE

World War I provides several examples of situations similar to those the JFC might face during future conflicts. Force tracking capability will assist the JFC in managing these situations more effectively.

During the first battle of the Marne, to mass sufficient combat power to engage German forces, General J.J.C. Joffre reluctantly withdrew elements from other commands to provide himself with a mass of maneuver for decisive action. This was a long and complicated process.<sup>20</sup> Force tracking provides the JFC visibility of all forces and the flexibility in planning and executing their movement.

### The Battle of Cambrai

--where a sudden onfall by tanks was substituted for the artillery preparation-- came within measurable distance of complete success, and failed only because of disregard of the basic principal of concentration; the tanks were scattered over a wide front, instead of being concentrated against decisive points, and there were insufficient reserves to exploit the initial gains.<sup>21</sup>

Visibility of forces in a similar scenario today would enable the JFC to concentrate forces according to changing battlefield conditions. Force tracking facilitates rerouting of forces before they reach originally planned destinations to meet changing conditions.

A World War I logistics summary magnifies the importance of force tracking to JFCs during future conflict.

In nineteen months, May 1917 through November 1918, more than two million American soldiers and nearly six million short tons of supplies and equipment for them were transported to France--half a million men and two million tons of supplies in the first thirteen months, and a million and a half men and four million tons of supplies in the last six months--and probably both figures could have been doubled in the next year.<sup>22</sup>

Although Operations Desert Shield and Desert Storm did not require the same force size needed during World War I to accomplish operational objectives, these operations still required long distance movement and matching of significant forces and equipment. To complicate matters, “. . . operational commanders in the . . . AOR required CENTCOM to repeatedly change the priority and the scheduling of unit movements in midstream.”<sup>23</sup> As a result, the combat power of joint forces was significantly degraded. Fortunately, time worked favorably for the JFC. In future operations, JFCs must exploit force tracking capabilities to expedite movement of forces, join them with the required equipment in theater, and position forces as the JFC sees most advantageous to achieving operational objectives. Lessons learned from Operations Desert Shield and Desert Storm prompted the Army’s current development of a technologically advanced force tracking system. However, lessons learned from past wars also provide a framework within which force tracking capabilities can be studied and improved.

### **VULNERABILITIES OF JOINT FORCE TRACKING**

The importance of force tracking to the regeneration of combat power is clear, however, the JFC must carefully consider several issues. These issues include the vulnerabilities of C4I-based systems to Information Warfare (IW) and the perceptions of “meddling” by tactical commanders.

While potential enemies currently lack the ability to significantly affect our technological supremacy, historical lessons indicate they will eventually develop that ability. Today, the JFC exploits computers and satellite-based technology to operate



Global Positioning Systems, Unmanned Aerial Vehicles and other C4I-based systems.

"While the computer has made it possible for the commander to plan and execute the synchronized, simultaneous effects of combat power against the enemy's entire structure, dependency on the computer has also made the commander vulnerable."<sup>24</sup> If Clausewitz were alive today, he might revise On War to include a discussion of IW and its impact on the outcome of battle and on the JFC.

Your command, logistics, fire support and intelligence systems depend on the exchange of information. Without doubt, information can be considered the hub of a modern enemy's operational power and strength. In modern operations, destroying an opponent's ability to gain, process and transmit information may be the surest way to destroy that enemy. With this in mind, I think that the idea of incapacitating an opponent's military force, or his society, by striking directly at his informational center of gravity will be useful in the future.<sup>25</sup>

Satellite and C4I-based systems including the force tracking system under development must include redundancies to counter enemy IW systems. The capabilities of future enemy IW technology may never match that of the U.S but it will be effective nevertheless.

For wires get cut, even if you have time to lay it in this war of today. And radio gets jammed, as anyone who has attempted to tune a broadcast set knows--by the oddest and sometimes most inexplicable interference. It takes skill to build a transmitter which will send a clear signal on a narrow band--but it only takes a little electric current and the clumsiest kind of spark-making apparatus to clutter the air with interfering noise.<sup>26</sup>

Joint force tracking capability enhances the JFC's ability to regenerate combat power during major operations and campaigns. The ability to track forces 7,000 miles from CONUS to the AOR then join forces with respective equipment, or the ability to reroute forces to support a contingency, assists the JFC in quickly regenerating combat power. However, the tactical commander may view certain actions directed by the JFC as

an infringement on his tactical responsibilities. The tactical commander may also perceive the JFC is directing “how” to execute rather than “what” to execute. This perception should fade as the tactical commander becomes increasingly familiar and knowledgeable with the force tracking system and its capability.

Due to human frailty, leadership traits or mistrust, operational commanders occasionally tell tactical commanders “how” to fight regardless of whether force tracking issues pertain. During future conflict, the tactical commander will also have force tracking capability. This capability at the operational and tactical levels should improve communications between commanders and increase the likelihood of achieving operational and strategic objectives.

## **CONCLUSION**

Joint force tracking and its impact on the regeneration of combat power is of growing concern, especially to the JFC separated from the AOR by great distances. Accordingly, this paper used USCENTCOM as a template for synthesizing and analyzing force tracking concepts. “USCENTCOM’s strategic challenge centers on the fact that the U.S. has critical interest far from our own shores, but close to potential threats, in a volatile region where political and fiscal constraints limit the nature and scope of U.S. forward presence.”<sup>27</sup> By synthesizing force tracking concepts and incorporating an integrated, easy-to-use C4I-based force tracking system that is invulnerable to enemy IW, the JFC enhances his joint force tracking capability. This capability in turn enables the

JFC to expedite the regeneration of combat power by minimizing the constraints imposed by space, time, and force.

The importance of force tracking applies not only to USCENTCOM but to every other operational commander. For example, U.S. Southern Command moves from Panama to Miami this year extending the distance between headquarters and the AOR. Pressure is also mounting on the U.S. to reduce and in some cases eliminate its presence in Asia, further increasing the distance between U.S. Pacific Command and the AOR. Force reductions in Europe similarly affect U.S. European Command. As these distances increase, the importance of force tracking to the regeneration of combat power also increases.

The next conflict will not provide the luxury of developed ports and logistics facilities which Saudi Arabia provided during the Gulf War.

The ability to use Saudi resources to support arriving forces was providential. . . . However, Persian Gulf states have infrastructure that are unusual among countries where the United States may deploy forces to resolve regional crises.<sup>28</sup>

An immature theater promotes confusion in force movement and logistics which affects the speed of combat power regeneration. Consequently, as JFC's and their operational staffs plan for the next conflict, force tracking and its impact on quick and effective regeneration of combat power increases in importance.

## NOTES

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<sup>21</sup>*Ibid.*, 33.

<sup>22</sup>James A. Huston, The Sinews of War: Army Logistics 1775-1953, (Washington: U.S. Dept of the Army, Office of the Chief of Military History, 1966), 354.

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<sup>25</sup>Anthony M. Coroalles, "On War in the Information Age: A Conversation with Carl von Clausewitz," Army, May 1996, 34.

<sup>26</sup>Dupuy, 130.

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